

New species of *Astragalus* L. sect. *Hymenostegis* (Fabaceae) from Iran

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Abstract:

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During the work on “Flora Iranica” seven new species of *Astragalus* sect. *Hymenostegis* could be discovered among the rich material collected in recent times. They are described here: *A. anguranensis*, *A. bashmaghensis*, *A. bradosticus*, *A. doghrunensis*, *A. marivanensis*, *A. pseudopersicus*, *A. qoturensis*.

Zusammenfassung:

Im Verlauf der Bearbeitung der Gattung *Astragalus* für die „Flora Iranica“ konnten sieben neue Arten der Sect. *Hymenostegis* aufgefunden werden, die hier beschrieben werden: *A. anguranensis*, *A. bashmaghensis*, *A. bradosticus*, *A. doghrunensis*, *A. marivanensis*, *A. pseudopersicus*, *A. qoturensis*.

Astragalus anguranensis Podlech & Maassoumi, spec. nov.

Holotype: Iran, prov. Zanjan, distr. Mahneshan, Anguran, Belgheis mts., 2800 m, 26.7.1998, R.R. Maassoumi & V. Mozaffarian 78520 (TARI; iso: MSB).

Differt praecipue et conspicue ab *A. pediculariforme* Maassoumi pedunculis pilis rectis appressis ad subappressis vel leviter ascendentibus 0,3–1 mm longis (nec dense pilis confuse patentibus ad 0,5 mm longis et paucioribus oblique patentibus ad patentibus 1,5–2,5 mm longis) obtectis.

Plants suffruticose, caespitose, 15–22 cm tall, spiny. Stems 6–15 cm long, the lower parts ligneous, branched, densely covered with blackish remnants of old leaves, parts of the current year 1–3 cm long. Stipules membranous-hyaline, 15–20 mm long, adnate to the petiole for ca. 8–10 mm, connate behind the stem for 1.5–4 mm, the free tips narrowly triangular, 8–10 mm long, glabrous or mostly ciliate at the margins with hairs up to 1.5 mm long, in basal parts with somewhat netlike nerves, slightly netlike dissolving with age. Leaves 3–8 cm long; petiole 1.5–3 cm long, like the rhachis rather densely covered with appressed hairs 0.3–0.7 mm long, sometimes glabrescent. Leaflets in 5–7 pairs, remote, narrowly elliptic, 10–20 × 2–4 mm, at the apex acuminate, pungent, with a cusp 0.5–3 mm long, on both sides in the youth rather densely to densely appressed hairy like the rhachis, with age mostly only sparsely to loosely hairy. Peduncles 2–4 cm long, shorter than the leaves, erect, densely covered with

appressed to slightly ascending straight hairs 0.3–1 mm long. Racemes ovoid to shortly cylindrical, 3.5–7 cm long and 2.5–3 cm in diameter, densely many-flowered. Bracts ± persistent, chartaceous-glumaceous, scarcely hyaline toward the margins, 10–12 mm long and 3–5 mm wide, ovate-acuminate, shortly aristate, glabrous or sparsely ciliate at the margins. Calyx tubular-inflated, 13–15 mm long and 4–5 mm wide, whitish or creamy, in upper part purplish, with purple parallel nerves and teeth, sparsely to rather densely covered with short hairs up to 0.5 mm long and rather densely with mostly ascending or sometimes partly spreading hairs 1–2.5 mm long; teeth ca. 5 mm long. Petals pink to purplish. Standard 17–18 mm long; blade ca. 8 mm wide, obovate-panduriform, rounded at the apex, slightly to distinctly constricted in lower part, at the base acutely hastate-auriculate, with widely cuneate claw. Wings ca. 16 mm long; blades narrowly obovate, at the apex rounded, ca. 7 × 3 mm; auricle ca. 0.3 mm long, claw 9–10 mm long. Keel ca. 14 mm long; blades obliquely obovate, with in upper part up to rectangularly curved lower edge and nearly straight upper edge, acutish at the apex, 4 × 2.5 mm; auricle short, claw 9–10 mm long. Ovary ca. 4–5 mm long, narrowly ellipsoidic, densely appressed hairy; style hairy at the base. Legumes unknown.

Other specimens seen:

Iran. Zanjan: ca. 77 km from Mahneshan to Anguran, 2300 m, 24.5.1987, *Maassoumi 64809* (TARI) – on the road to Mahneshan, meck mountain [SE of Mahneshan], 1950 m, 25.7.1998, *Maassoumi & Mozaffarian 78505* (MSB).

Astragalus bashmaghensis Maassoumi & Podlech, spec. nov.

Holotype: Iran, Kordestan, Saqqez, between Sonnate and Divandarreh, Kuh-e Ghaleh, neck mt. between Bashmagh and Jafarabad, 2300 m, 14.7.1991, *V. Mozaffarian 70063* (TARI; iso: MSB!).

Differt ab *A. doghrunense* Maassoumi & Podlech foliis 10–17 (nec 2–6) cm longis, foliolis 10–22 × 3–4 (nec 5–9 × 1,5–3) mm, pedunculis 12–18 (nec 5–8) cm longis, racemis elongatis, 6–10 (nec 3–4) cm longis, bracteis 10–15 × 5–7 (nec 9–10 × 3–5) mm, calyce pilis longioribus 2–3(–4) (nec 1–1,5) mm longis obtecto.

Plants 22–30 cm tall, subcaulescent. Stems up to 7 cm long, the lower parts ligneous, branched, densely covered with blackish remnants of old leaves, part of the current year 1–2 cm long. Stipules hyaline-membranous, whitish, 15–20 mm long, narrowly triangular, adnate to the petiole for 5–8 mm, shortly connate behind the stem, the free tips many-nerved, glabrous, ciliate at the margins with ascending hairs up to 1 mm long. Leaves 2–6 cm long; petiole 3–5 cm long, like the rhachis loosely to rather densely covered with appressed to partly slightly ascending hairs 0.2–0.8 mm long. Leaflets in 6–9 pairs, narrowly elliptic, 10–22 × 3–4 mm, acuminate with a cusp 1–2 mm long, on both sides sparsely to loosely covered with appressed to subappressed hairs 0.3–0.6 mm long. Peduncles 12–18 cm long, up to 3 mm thick, ± as long as the leaves, loosely to densely covered with appressed to subappressed hairs 0.3–1(–1.5) mm long. Racemes cylindric, 6–10 cm long and ca. 2 cm in diameter, densely many-flowered. Bracts chartaceous, not hyaline, yellowish, partly falling, 10–15 mm long, 5–7 mm wide, ovate-acuminate, glabrous, rarely very sparsely shortly ciliate. Calyx pale yellowish, at first tubular-ventricous, soon becoming elliptically inflated, 13–15 mm long,

rather densely covered with short hairs 0.2–0.5 mm long and with ascending hairs 2–3(–4) mm long; teeth subulate, ca. 5 mm long. Petals pale yellow. Standard ca. 17 mm long; blade obovate-panduriform to ovate, ca. 7 mm wide, rounded but minutely mucronulate at the apex, slightly constricted below the middle or not, angular-hastate at the base, with widely cuneate claw. Wings ca. 15 mm long; blades narrowly oblong, rounded at the apex, 6×2 mm; auricle ca. 0.3 mm long, claw ca. 10 mm long. Keel ca. 15 mm long; blades obliquely obovate, with in upper part rectangularly curved lower edge and slightly convex upper edge, at the apex subacute, ca. 5×2.8 mm; auricle minute, claw 10 mm long. Ovary narrowly ellipsoid, ca. 5 mm long, densely appressed hairy; style hairy at the base. Legumes unknown.

Astragalus bradosticus Maassoumi & Podlech, spec. nov.

Holotype: Iran, Azerbaijan, Oroumieh, Mavana, Hakki mt. W of the village Hakki, 2100–2700 m, 31.7.1995, *V. Mozaffarian, R.R. Maassoumi & Safavi 75442* (TARI; iso: MSB).

Differt ab *A. demonstrato* Maassoumi stipulis 8–10 (nec 15–18) mm longis, foliis minoribus, $6-10 \times 1.5-3$ (nec $10-23 \times 2-3$) mm, calyce 12–15 (nec 16–19) mm longo, vexillo ca. 16 (nec 22–26) mm longo, lamina alarum $6.5-7 \times 2-2.5$ (nec $11-12 \times 2-3$) mm.

Plants suffruticose, caespitose, spiny, 17–20 cm tall, subcaulescent. Stems up to 10 cm long, branched at the base, in older parts densely covered with greyish-brown remnants of old leaves, parts of the current year ca. 1 cm long. Stipules thinly hyaline-membranous, pale yellowish, 8–10 mm long, adnate to the petiole for 4–5 mm, shortly connate behind the stem, the free tips narrowly triangular-acuminate, glabrous or sparsely ciliate at the margins. Leaves 4–7 cm long; petiole 1–1.5 cm long, like the rhachis rather densely to densely covered with subappressed to partly slightly ascending hairs 0.2–0.5 mm long and with few ascending hairs up to 1 mm long, spiny. Leaflets in 6–7 pairs, narrowly elliptic, $6-10 \times 1.5-3$ mm, at the apex acuminate-aristate, pungent, with a cusp 0.5–1 mm long, on both sides rather densely to densely covered with subappressed to partly slightly ascending hairs 0.3–0.5 mm long. Peduncles very short to nearly absent, with spreading hairs. Racemes nearly globular, 2.5–3 cm long and ca. 2.5 cm in diameter, rather densely many-flowered. Bracts partly falling, thinly membranous, 8–15 mm long and 4–5 mm wide, ovate to narrowly ovate, acuminate, glabrous or sparsely hairy, especially near the base and along the mid-line, ciliate at the margins. Calyx during the anthesis tubular, later on slightly inflated, 12–15 mm long and ca. 4 mm wide, whitish-yellow or sometimes towards the apex with purplish nerves, rather densely covered with ascending to spreading hairs 0.3–0.5 mm long and with ascending hairs 1.5–3 mm long; teeth subulate, purple, 6–7 mm long. Petals purplish-violet, soon fading to yellowish. Standard ca. 16 mm long; blade ca. 7 mm wide, obovate, slightly emarginate at the apex, at the base not hastate-auriculate but subangularly narrowed into the short cuneate claw. Wings 15–16 mm long; blades narrowly elliptic, at the apex obtuse, $6.5-7 \times 2-2.5$ mm; $11-12 \times 2-3$ mm; auricle ca. 0.3 mm long, claw 10–11 mm long. Keel ca. 13 mm long; blades obliquely obovate, acutish at the apex, ca. 4.5×2 mm; auricle short, claw 10–11 mm long. Ovary subsessile, ca. 4 mm long, densely subappressed hairy; style glabrous. Legumes unknown.

Other specimens seen:

Iran. Azərbaycan Garbi: Oroumieh, Silvana, mts. W of the village, 1700–2100 m, 31.7.1995, *Mozaffarian, Maassoumi & Safavi 75424* (MSB, TARI).

Astragalus doghrunensis Maassoumi & Podlech, spec. nov.

Holotype: Iran, Azarbayejan Sarki: Arasbaran protected area, Doghrun mountain, 2500–2800 m, 13.7.1977, *M. Assadi & H. Sardabi 23974* (TARI).

Differt ab *A. recognito* Fisch. stipulis hyalino-membranaceis, albidis (nec chartaceis, flavidis), foliolis utrinque pilis appressis vel subappressis laxe vel interdum densiuscule obtectis (nec dense ad densissime pilosis), pedunculis densiuscule pilis appressis, ± rectis brevibus (nec pilis confusis crispis subappressis) et paucioribus 1–1,5 mm longis obtectis, bracteis glabris (nec saltem partim pilosis), calyce 11–13 (nec 13–18) mm longo, dentibus 4–5 (nec 5–8) mm longis.

Plants 18–20 cm tall, caespitose. Stems 6–10 cm long, the lower parts ligneous, branched, densely covered with blackish remnants of old leaves, part of the current year 1–2 cm long. Stipules hyaline-membranous, whitish, 12–18 mm long, adnate to the petiole for 6–10 mm, connate for 1–2 mm, the free tips narrowly triangular-acuminate, many-nerved, glabrous or more rarely the lower ones hairy, ciliate at the margins with ascending hairs up to 1 mm long. Leaves 2–6 cm long; petiole 1–2 cm long, like the rhachis densely covered with appressed to partly slightly ascending hairs 0.2–0.5 mm long. Leaflets in 5–7 pairs, narrowly elliptic, 5–9 × 1.5–3 mm, acuminate with a cusp 0.5–1 mm long, on both sides loosely to more rarely rather densely covered with appressed to subappressed hairs 0.4–0.8 mm long. Peduncles 5–8 cm long, ± as long as the leaves, rather densely covered with ± appressed, short hairs 0.3–0.5 mm long and with much fewer hairs 1–1.5 mm long. Racemes 3–4 cm long and 2–2.5 cm in diameter, rather densely many-flowered. Bracts chartaceous, not hyaline, yellowish, lower ones or all mostly easily falling, 9–10 mm long, 3–5 mm wide, ovate, long acuminate, glabrous, ciliate. Calyx pale yellowish, at first tubular, soon becoming elliptic- to globose-inflated, 11–13 mm long, 5–7 mm wide, loosely to rather densely covered with short hairs 0.2–0.5 mm long and with ascending hairs 1–1.5 mm long; teeth subulate, 4–5 mm long. Petals pale yellow. Standard ca. 19 mm long; blade obovate-panduriform, ca. 7 mm wide, rounded but minutely mucronulate at the apex, slightly constricted below the middle, angular-hastate at the base, with widely cuneate claw. Wings ca. 16 mm long; blades narrowly obovate, rounded at the apex, 6–6.5 × 2.8–3 mm; auricle ca. 0.3 mm long, claw ca. 10 mm long. Keel ca. 15 mm long; blades obliquely obovate, with in upper part rectangularly curved lower edge and slightly convex upper edge, at the apex subacute, ca. 5 × 2.8 mm; auricle minute, claw 10 mm long. Ovary narrowly elliptic, ca. 4 mm long, densely appressed hairy; style hairy at the base. Legumes unknown.

Other specimen seen:

Iran. Azərbaycan Sarki: Arasbaran protected area, Doghrun mountain, 2500 m, 15.7.1977, *Assadi & Sardabi 23921* (TARI).

Astragalus marivanensis Podlech & Maassoumi, spec. nov.

Holotype: Iran, prov. Kordestan, 50 km from Baneh to Marivan, 1650 m, 30.5.1978, *H. Runemark* & *V. Mozaffarian* 29326 (TARI; iso: MSB).

Differt ab *A. chrysostachyde* Boiss. petiolo rhachideque pilis laxae ad dense patentibus (nec appressis vel subappressis obiecto, foliis 6–9-jugis (nec 4–7-jugis), utrinque pilis oblique patentibus (nec appressis ad subappressis) obiectis, pedunculo pilis patentibus (nec appressis) obiecto, bracteis dorso in linea mediana pilosis (nec glabris), calyce 17–20 (nec 13–16) mm longo, dentibus 8–10 mm (nec 4–6 mm) longis.

Plants suffruticose, caespitose, spiny, 20–30 cm tall. Caudex very thick, up to 2 cm in diameter, branched. Stems 5–10 cm long, the lower parts ligneous, covered with dark brownish bark and remnants of old leaves, branched, parts of the current year 1.5–3 cm long, completely covered by leaf stipules. Stipules hyaline-membranous, 10–18 mm long, adnate to the petiole for 5–9 mm, connate behind the stem for 1–3 mm, the free tips narrowly triangular-acuminate, glabrous. Leaves 4–12 cm long; petiole 1.5–3.5 cm long, like the rachis loosely to densely covered with spreading hairs 0.2–0.5 mm long, spiny, at the insertion of leaflets with minute ovoid, sessile glands. Leaflets in 6–9 pairs, narrowly elliptic, 6–20 × (1.5–)2–5 mm, acuminate, pungent, with a cusp 0.5–2 mm long, on both sides loosely to densely covered with ascending to sometimes ± spreading hairs (0.3–)0.6–1.5 mm long. Peduncles 8–15 cm long, erect or ascending, rather densely to densely covered with ascending to spreading, tangled, curly hairs 0.2–0.5 mm long and with ± straight, spreading hairs 1–2 mm long, sometimes glabrescent in upper part. Racemes ovoid to shortly cylindrical, 4–10 cm long and 3–3.5 cm in diameter, densely many-flowered. Bracts partly falling, membranous, hyaline towards the margins, pale yellowish, 10–15 mm long and 4–6 mm wide, narrowly ovate-acuminate, shortly aristate, hairy along the midline. Calyx 17–20 mm long, at the beginning of anthesis tubular, slightly ventricose, later on ovoid-inflated and 5–6 mm wide, pale yellowish, rather densely covered with ascending to ± spreading hairs 2.5–3.5 mm long; teeth subulate, 8–10 mm long. Petals pale yellow. Standard ca. 20 mm long; blade ca. 6 mm wide, obovate-panduriform, obtuse to minutely mucronulate at the apex, distinctly constricted in lower part, at the base ± sharply angular-auriculate, abruptly narrowed into the narrowly cuneate claw. Wings ca. 18 mm long; blades elliptic, at the apex obtuse, ca. 7 × 2.5 mm; auricle minute, ca. 0.3 mm long, claw ca. 11 mm long. Keel ca. 15 mm long; blades obliquely obovate; with widely, sometimes nearly rectangular-curved lower edge and nearly straight upper edge, acutish at the apex, ca. 5 × 2.5 mm; auricle minute, claw ca. 10 mm long. Ovary ca. 5 mm long, elliptic, very densely ascending hairy; style glabrous. Legumes unknown.

Other specimens seen:

Iraq. Rowanduz distr. (MRO): in montis Kuh-Sefin, 1100–1200 m, 2.5.1893, *Bornmüller* 1177, 1177b (B) – in monte Handarin [Handren], 1300 m, 28.7.1893, *Bornmüller* 1178 (B).

Iran. Kordestan: ca. 35 km from Baneh on road to Mahabad, after Kavalan, Ganeh-Dar village, 1650 m, 13.6.2000, *Maassoumi* & *Nikchehreh* 80225 (MSB, TARI) – ca. 46 km from Sanandaj on the road to Saghez, 5 km after Iran-shah, 2000 m, 13.6.2000, *Maassoumi* & *Nikchehreh* 80213, 80214 (MSB, TARI).

Astragalus pseudopersicus Podlech & Maassoumi, spec. nov.

Holotype: Iran, prov. Azarbaijan Sarki, ca. 5 km S of Tabriz to Sperkhan, 1600 m, 3.7.1991, *V. Mozaffarian 69853* (TARI; iso: MSB).

Differt ab *A. persicus* pedunculis crassis, ca. 2.5 mm diametro (nec sat tenuibus, ca. 1 mm diametro), bracteis 14–17 (nec 5–8) mm longis, 6–7 (nec 4–5) mm latis, sat longe acuminati-aristatis (nec breviter acuminatis), calyce 14–16 (nec 11–13) mm longo petalis ± aequilongo (nec eis distincte breviores), petalis pallide lilacina nec obscure purpurei-violaceis.

Plants suffruticose, caespitose, spiny, 25–35 cm tall. Stems 10–15 cm long, the older parts ligneous, branched, covered with blackish remnants of old leaves, parts of the current year 1.5–3 cm long, densely covered with nearly spreading hairs up to 2 mm long, but mostly completely covered by the stipules. Stipules chartaceous, pale yellowish, 15–18 mm long, with in basal part reticulate nerves, adnate to the petiole for 8–10 mm, connate behind the stem for 2–3 mm, the free tips triangular to long acuminate, ciliate at the margins with hairs up to 1 mm long. Leaves 7–12 cm long; petiole 1.5–3 cm long, like the rhachis rather densely to densely covered with ± spreading, tangled, often flexuose hairs 0.3–0.8 mm long. Leaflets in 5–6 pairs, narrowly elliptic, 10–20 × 2–3 mm, at the apex acuminate-aristate, pungent, with a cusp 1–2 mm long, on both sides densely covered with subappressed to ascending hairs 0.5–1 mm long. Peduncles 7–13 cm long, thick, up to 2.5 mm in diameter, as long as to longer than the leaves, densely covered with tousled, ± spreading hairs 0.2–2 mm long. Racemes ovoid to shortly cylindric, 4–6 cm long, 2.5–3 cm wide, densely many-flowered. Bracts partly falling, membranous, but scarcely hyaline at the margins, whitish-yellowish, towards the tip mostly purple, (12–)14–17 mm long, 6–7 mm wide, ovate to widely ovate, ± long acuminate-aristate, rather densely to densely subappressed hairy, with hairs 0.3–1 mm long. Calyx at first tubular, later on slightly inflated, 14–16 mm long, 3–4 mm wide, whitish with pale purplish teeth, rather densely covered with ascending to spreading hairs 2.5–4 mm long; teeth subulate, 4–6 mm long. Petals in dry state pale lilac to violet. Standard 15–17 mm long, ± as long as calyx teeth; blade 5–5.5 mm wide, obovate-panduriform, rounded to slightly retuse at the apex, slightly constricted below the middle, at the base shortly angular-hastate, gradually narrowed into the cuneate claw. Wings 14–16 mm long; blades narrowly elliptic, obtuse at the apex, 5–7 × 1.8–2.4 mm; auricle short, claw 9–10 mm long. Keel 13–14 mm long; blades obliquely obovate, with in upper part curved lower edge and ± straight upper edge, subacute at the apex, 5 × 2.5–3 mm; auricle indistinct, claw 8–9 mm long. Ovary sessile, ca. 5 mm long, ellipsoidic, densely hairy; style hairy in lower part. Legumes unknown.

Other specimen seen:

Iran. Azarbaijan Sarki: Sahand, S. of Sperkhan, 2500–2850 m, 10.9.1981, *Mozaffarian & Mohammadi 37535* (TARI).

Astragalus qoturensis Podlech, spec. nov.

Holotype: Iran, Azarbaijan Garbi, Kuh Kani Ziarat N Habashi Bala prope Qotur, 2300–3000 m, 18.7.1974, *W.Rechinger & J. Renz* in Rechinger 49644 (M; iso: TARI, W).

Differt ab omnibus speciebus sectionis *Hymenostegis* vexillo dorso sparse subappresse piloso.

Plants suffruticose, caespitose, spiny, 18–22 cm tall. Stems 6–10 cm long, the older parts ligneous, divided, in upper parts covered with dark grey-brownish remnants of old leaves, parts of the current year 1.5–2 cm long. Stipules hyaline-membranous, whitish, 12–15 mm long, with many, at the base netlike nerves, therefore netlike dissolving with age, adnate to the petiole for 6–8 mm, connate behind the stem for 2–3 mm, the free tips narrowly triangular, ciliate at the margins with spreading hairs up to 1 mm long. Leaves (2–)3–9 cm long; petiole 0.8–2.5 cm long, like the rhachis densely covered with tangled, appressed to subappressed hairs 0.05–0.4 and with fewer hairs up to 1 mm long, spiny. Leaflets in (2–)6–8 pairs, narrowly elliptic, 7–12 × 1.5–3 mm, at the apex acuminate-aristate, pungent, with a cusp ca. 1 mm long, on both sides densely to very densely covered with subappressed hairs 0.3–0.8(–1) mm long. Peduncles 5–8 cm long, as long as or slightly longer than the leaves, densely covered with short, appressed to subappressed hairs 0.3–0.8 mm long and with fewer, longer, subappressed to slightly ascending hairs up to 2 mm long. Racemes globular to ovoid, 2.5–4 cm long, 2–2.5 cm wide, densely many-flowered. Bracts partly falling, chartaceous, yellowish, 7–12 mm long, 3–4.5 mm wide, ovate-acuminate, partly with an awn up to 5 mm long, loosely to rather densely covered with subappressed to slightly ascending hairs. Calyx at first tubular, slightly inflated, later on ovoid-inflated, 12–14 mm long, 4–5 mm wide, whitish with purplish teeth, rather densely covered with short, flexuose hairs 0.3–0.5 mm long and with ascending to nearly spreading hairs 1–2 mm long; teeth subulate, 4–5 mm long. Petals violet, with standard sparsely hairy on the back. Standard ca. 17 mm long; blade ca. 7 mm wide, oblong, retuse at the apex, not or scarcely constricted below the middle, at the base indistinctly obtusely angular, gradually narrowed into the cuneate claw. Wings ca. 16 mm long; blades narrowly elliptic, obtuse at the apex, ca. 7 × 2.5 mm; auricle ca. 0.4 mm long, claw ca. 9 mm long. Keel ca. 13 mm long; blades obliquely obovate, with widely rectangularly curved lower edge and slightly convex upper edge, acutish at the apex, ca. 5 × 3 mm; auricle indistinct, claw ca. 9 mm long. Ovary sessile, ellipsoidic, ca. 5 mm long, densely hairy; style hairy in lower part. Legumes unknown.

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